IN THE MATTER of the Resource Management Act 1991

AND

IN THE MATTER of applications by Waka Kotahi NZ Transport Agency (Waka Kotahi) to Manawatū-Whanganui Regional Council and Greater Wellington Regional Council for resource consents to enable the construction, operation and maintenance of new state highway, shared use path and associated infrastructure, between Taylors Road (to the north of Ōtaki) and Stage Highway 1 north of Levin.

SECTION 87F REPORT OF JAMES STUART LAMBIE – TERRESTRIAL ECOLOGY

MANAWATŪ-WHANGANUI REGIONAL COUNCIL AND GREATER WELLINGTON REGIONAL COUNCIL

28 April 2023

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A. OUTLINE OF REPORT

1. This report, required by section 87F of the Resource Management Act 1991 ("**RMA**"), addresses terrestrial (including wetland) ecology effects arising from the resource consent applications lodged with the Manawatū-Whanganui Regional Council ("**Horizons**") and Greater Wellington Regional Council ("**GWRC**") for the Ōtaki to North of Levin Highway Project (the "**Ō2NL Project**").

2. The resource consents applied for, by Waka Kotahi NZ Transport Agency ("**Waka Kotahi**"), are required to authorise the construction, operation and maintenance of the new state highway, shared use path and associated infrastructure, between Taylors Road (to the north of Ōtaki) and State Highway 1 north of Levin.

3. In addition, Waka Kotahi separately lodged Notices of Requirement ("**NoRs**") relating to the Ō2NL Project with Horowhenua District Council and Kāpiti Coast District Council (the "**District Councils**"), respectively. Matters relating to the NoRs are outside the scope of this report, and are being addressed by technical advisors for the District Councils.

4. In preparing this report, I have relied on the expert advice from the following technical advisors within the Horizons and GWRC reporting teams:

   (a) Julia Williams – Landscape Visual and Natural Character for the Regional and District Councils; and

   (b) Peter Stacey – Air Quality for the Regional and District Councils.

5. I have also liaised with the Mr Bryn Hickson-Rowden, who is reporting on terrestrial and freshwater ecology for the District Councils in the preparation of this report. Where I rely on Mr Hickson-Rowden's reporting, I have identified it within my report.

6. While this report is pursuant to section 87F of the RMA, I have in accordance with section 42A(1A) and (1B) attempted to minimise the repetition of information included in the application and where I have considered it appropriate, adopted that information.

B. QUALIFICATIONS / EXPERIENCE

7. My name is James Stuart Lambie. I am an independent ecologist and biosecurity policy advisor. I have held this position since 2017. Prior to this, I was employed by Horizons; first, in the role of Research Associate (ecology), then Environmental Scientist (ecology), then finally, as the Science Coordinator, for 11 years. Prior to Horizons, I was a biosecurity officer with the GWRC.

8. My work involves project-based technical investigations that include desk-top and in-field ecological evaluations of terrestrial and wetland habitats and the assessment of effects of proposed activities on terrestrial and wetland ecosystems. Past projects include the review of the resource consent application and notices of requirement for Te Ahu a Turanga – the Manawatū Tararua Highway Project as well as other large-scale infrastructure projects (namely windfarms and wastewater treatment plants) in the Manawatū-Whanganui Region. I remain engaged by Horizons for ecologist support regarding consenting and compliance matters for projects as they arise.

9. I hold the qualification of Bachelor of Science (Massey University) and a Master of Applied Science in Resource Management (Lincoln University). I am a member of the New Zealand Ecological Society and member of the New Zealand Biosecurity Institute.

10. I am familiar with the site and surrounding area. I visited the site along with other Horizons and GWRC experts on 3 August 2022 (consisting of a general overview of the designation route, including a visit to Arapaepae Bush and examples of the affected wetland types in both regions) and on 21 September 2022 (specifically to familiarise myself with the Te Ripo o Hinemata wetland offset site).

C. CODE OF CONDUCT

11. I confirm that I have read and agree to comply with the Code of Conduct for Expert Witnesses contained in the Environment Court Practice Note 2023. I confirm that I have stated the reasons for my opinions I express in this report and considered all the material facts that I am aware of that might alter or detract from those opinions.

12. My report addresses the potential terrestrial (including wetland) ecology effects relating to the construction and operation of the Ō2NL Project. Statements expressed and issues identified in this report are made within the scope of my expertise, except where I rely on the technical advice that I have referred to above.

13. In all but two instances, I have all the information necessary to assess the application within the scope of my expertise and am not aware of any other gaps in the information or my knowledge. The two exceptions include:

    (a) The application does not identify the residual effect on the gravelfield habitat.[1] The consequence is that the significance of the loss of this habitat may be underestimated. However, I am reasonably confident the effect can be appropriately managed.

    (b) There may be pasture-dominated wetlands assessed as not being 'inland natural wetlands' under the National Policy Statement Freshwater Management ("**NPS-FM**") at the time the application was lodged. The NPS-FM was amended in December 2022, with changes to, among other things, the exclusions from the definition of 'natural inland wetlands'. Additional natural inland natural wetlands may require consideration under the new definition depending on whether the pasture species are identified on the *National List of Exotic Pasture Species*. These will need to be assessed and the effects hierarchy applied in accordance with the statutory framework I discuss below.

D. EXECUTIVE SUMMARY

14. The key conclusions of my report include:

    (a) The proposed construction envelope avoids significant areas of old growth indigenous forests and large wetlands and seeks to avoid effects on fauna through various strategies such as species translocations and avoiding habitat clearance at critical

[1] The application describes this as the "TBCA" effect on the TG1 gravelfield habitat. See Appendix J, page 72.

nesting times. There are various remedies and mitigations proposed that further minimise the effects on flora and fauna to the fullest extent possible. These measures include use of buffers, restoration of ecological linkages and a wildlife sanctuary - all of which hold promise to result in improved biodiversity outcomes. Nevertheless, there are losses of areas of significant indigenous vegetation with residual significant ecological effects that cannot reasonably be avoided, remedied or mitigated.

(b) It is proposed to manage these unavoidable losses using biodiversity offsetting for net gain. The policy frameworks under the Manawatū-Whanganui Regional One Plan ("**One Plan**") and the GWRC's Proposed Natural Resource Plan ("**PNRP**") provide for offsetting.

(c) There are differences between the level of faunal value of habitats reported by fauna experts and the vegetation value of habitat recorded in Technical Assessment J.[2] While the differences are not so great as to necessitate any change to the proposed approach to managing effects on biodiversity, it does highlight how crucial certain proposals are to ensuring that the effects hierarchy is being followed. This is necessary to ensure that the offsets deal only with effects on fauna that cannot be avoided in the first instance, or failing that, remedied / mitigated. The proposed offsets are appropriate only after the avoid, remedy, mitigate hierarchy has been met, and should deliver biodiversity gains that are commensurate with the type and scale of effect.

(d) Among the strategies for mitigating effects is the transfer of high value units of wetland vegetation into adjacent lower value wetland. I observe that this strategy is more akin to mitigation than offset as it retains near-*situ* the most valuable habitat for birds using the wetland and/or the valuable vegetative component of the wetland itself. Nevertheless, the loss of the

[2] Technical Assessment J, Table J.3, pp 65-73 vs Technical Assessment J.5 Table 6, pp 49-52 and Technical Assessment J.6, Table 4, pp 34-35.

lesser valued recipient site still needs to be offset. This loss has been accounted for in the wetland biodiversity offset model.

(e) In my opinion, the proposed offsetting and/or compensation is appropriate. All offsets are calculated for adverse effects that are higher than "low" (and not solely those habitats identified as significant under the One Plan and PNRP) and therefore the proposed scale of offsetting potentially goes beyond what is expected by the relevant plan provisions. The offset calculations (which I agree with) demonstrate that residual ecological effects are able to be appropriately managed and a net overall biodiversity gain can be achieved and maintained. None of the affected habitats are so vulnerable and none of the adverse residual effects are so large that they are beyond the limits of offsetting.

(f) I agree that Te Ripo o Hinemata is an appropriate offset site for wetland effects management. However, it cannot provide the necessary mitigation of natural character, which must be place-based (in the vicinity of the effect).

(g) When comparing the offset proposals against the biodiversity policy frameworks, it is my opinion that the offsets are consistent with the regional plans of both Horizons and GWRC. I have considered PNRP Schedule G4 and, in my view and on the information available, the proposed offsets do not engage Schedule G4.

(h) Dust is a minor issue for the forest remnants adjacent to the construction envelope if it is managed within nuisance levels and the proposed buffers are implemented. Mr Peter Stacey discusses the management of dust within nuisance levels further in his report.

(i) Buffer planting and certain elements of the landscape and ecological plantings are essential for the mitigation of ecological effects, as well as the restoration and maintenance of natural character. Of particular concern is that these plantings are

subject to third-party approval which may lead to the effects not being managed to the extent anticipated under the effects assessment.

15. Overall, I am of the opinion that the assessment of terrestrial and wetland ecological effects is thorough. The effects management hierarchy has been traversed by Waka Kotahi experts before resorting to offsetting, with measures that include the explicit avoidance of high value forests, and checks and balances that avoid, remedy, or mitigate effects on rare or vulnerable flora and fauna. The offsetting and compensation proposals meet the biodiversity policy expectations of the regional planning frameworks. I have critically examined areas of the reporting that are less clear to me, only to conclude that the overall package of ecological effects management is generally sound.

16. It will be important to ensure delivery of the proposed approach to managing ecological effects through the conditions. I have recommended a suite of condition changes to improve certainty on biodiversity outcomes.

17. Subject to imposition of these conditions, if the strategies proposed to avoid, remedy, mitigate and offset the ecological effects are implemented, the O2NL Project will result in biodiversity outcomes that are an improvement on the current environment.

E. SCOPE OF REPORT

18. My report focuses only on issues related to effects on terrestrial and wetland habitats and effects on indigenous flora and fauna. It covers the following topics:

    (a) The potential terrestrial ecology effects arising from the construction and operation of the Ō2NL Project;

    (b) A review of the terrestrial ecology assessment provided by Waka Kotahi, including issues relating to:

        (i) Loss of extent of indigenous-dominant habitats;

        (ii) Managing the effects on threatened flora and fauna;

(iii) The appropriateness of offsetting;

(iv) The appropriateness of Te Ripo o Hinemata as a wetland offset site;

(c) Proposed conditions; and

(d) Submissions as they relate to terrestrial ecology matters.

19. I have reviewed and relied on the information provided by:

(a) Nicholas Goldwater, Nicki Papworth, Jamie MacKay, Della Bennet, Trent Bell, and Brian Patrick - Technical Assessment J: Terrestrial Ecology (and sub-appendices), Volume IV of the Application ("**Technical Assessment J**");

(b) Gavin Lister - Technical Assessment D: Landscape Visual and Natural Character, Volume IV of the Application;

(c) The Applicant's response to the request for further information under section 92 of the RMA, by the Regional and District Councils, dated 22 December 2022 (the "**Section 92 Response**");

(d) Letter from Waka Kotahi to Helen Anderson and Mark St Clair, Ō2NL Project, dated 21 March 2023 ("**Waka Kotahi March letter**").

20. I have also reviewed technical reports on stormwater, erosion and sediment control, dust and natural character where they are relevant to terrestrial ecological issues or the management of effects on ecological issues.

F. BACKGROUND – TERRESTRIAL ECOLOGY OVERVIEW

21. The description of the Ō2NL Project, including design, existing environment, and potential effects on indigenous habitats, flora and fauna is set out in the Ō2NL Project Assessment of Effects on the Environment ("**AEE**"), including supporting technical documentation. In my view, the AEE provides sufficient detail to ascertain the impact on

terrestrial and wetland ecosystems and residual effects on indigenous biological diversity.

22. The methodologies chosen to describe indigenous habitats and their value, to enumerate floral and faunal values, and to assess the scale and type of effects on terrestrial and wetland biodiversity follow well recognised protocols. I have no concern with the methods used. I note that Mr Hickson-Rowden for the District Councils has advised that the level of monitoring for the presence of bats is inconsistent with 'best practice' standard practices, and I defer to his experience on this matter.

23. The chosen route and construction footprint presented in the application avoids areas of old growth forest and large wetlands. Nevertheless, there are areas of regenerating indigenous-dominant forest and trees lands, small wetlands, and other habitats of indigenous flora and fauna that occur within the proposed construction footprint and may be impacted by the proposal. Many of the impacts are proposed to be avoided or minimised by a range of methods including timing works to occur outside critical nesting seasons of rare or threatened birds, translocation of lizards from impacted sites into a habitat free of predators, transfer of high value wetland units of vegetation into lower value parts of the same wetland that are adjacent to the construction, buffering of areas of forest to further reduce the edge effects on the fauna living within them, and improving ecological linkages in the landscape to manage the perpetual effect of the new road as a barrier to migration.

24. However, even after these avoidance and minimisation measures are accounted for, the application recognises that there are instances where the residual effect on habitats recognised as significant under the One Plan / PNRP remain more than minor. These effects are proposed to be offset and/or compensated.

G. STAUTORY FRAMEWORK

25. The approach set out in Horizons' One Plan Policy 13-4 is that "more than minor" adverse effects on rare habitats, at risk habitats, and threatened habitats should be "avoided, remedied, or mitigated". If these

outcomes cannot be achieved, then an offset resulting in a net indigenous biological diversity gain is expected, so long as the matters in Policy 13-4(d) are satisfied. It is important to note that where adverse effects cannot be avoided or mitigated at the point of the adverse effect then an offset to result in net gain must be able to be achieved and maintained. The One Plan does not distinguish between "Offsetting" and "Compensation".[3]

26. Similarly, Policy P31 in the PNRP sets out the effects management hierarchy for activities that risk causing adverse effects on the values of habitats listed in Schedule F of the PNRP. If it is not practicable to avoid those habitats then the effects must be remedied and where there are more than minor residual adverse effects that cannot be avoided, minimised, or remedied, biodiversity offsetting is provided for in accordance with Schedule G2. Biodiversity offsetting is preferable to compensation under the PRNP and, in accordance with the effects management hierarchy, compensation (following Schedule G3) should only be considered after the potential for offsetting biodiversity values has been determined to not be a viable option. In relation to activities within natural wetlands, the offsetting and compensation avenues are only available to activities which meet the exceptions in Policy P110.

27. PNRP Schedule C1 identifies "O-te-pua Wetland" as a site of significance to Ngā Hāpu o Ōtaki. PNRP Policy P49 provides that offsetting of adverse effects in sites of significance to mana whenua is only appropriate where the relevant mana whenua expressly confirms that the offset proposal is consistent with (among other things) the principles set out in Schedule G4.

28. "O-te-pua Wetland" (referred to as Paruauku Swamp in Waka Kotahi's ecological assessment) is affected by the Project, potentially engaging Policy P49. However, on closer review of the GWRC Maps, the Schedule C1 "O-te-pua Wetland" site of significance does not overlap with the Paruauku Swamp remnants affected by the Project (See **Figure 1**, Section M).

[3] The definition of "offsetting" and its distinction from "compensation" is eloquently detailed in Technical Assessment J: Paras 233 to 237.

29. Accordingly, based on the information currently available, I consider that Schedule G4 of the PNRP is not engaged by the Project.

30. The National Environmental Standards for Freshwater ("**NES-FW**") and NPS-FM are relevant to the management of effects on natural inland wetlands. The identification of what is (or is exempt from being) a 'natural inland wetland' is informed by the recent December 2022 version of the NPS-FM. In the context of the landscape of the Ō2NL Project, under the NPS-FM a natural inland wetland means a wetland (following the RMA definition) outside the coastal marine area that is not a deliberately constructed waterbody, other than a wetland constructed to offset impacts on, or to restore an existing or former natural inland wetland (i.e. farm dam or amenity pond); or a wetland that is within an area of pasture used for grazing and has vegetation cover comprising more than 50% exotic pasture species (as identified in the *National List of Exotic Pasture Species*) unless that wetland is the habitat of the threatened species.

31. Under the NPS-FM, loss of any extent of a wetland that is identifiable as natural inland wetland is to be avoided unless a functional need for the activity to locate in the selected location can be demonstrated. Where there is a functional need for the activity to be located in the selected location, the relevant effects must be addressed through application of the effects management hierarchy. When considering the effects management hierarchy, the process is much the same as described within the PNRP, as I have set out above.

H. TERRESTERIAL AND WETLAND ECOLOGY EFFECTS

32. While the Ō2NL Project avoids old growth indigenous forest remnants and large wetlands, it will adversely affect the ecological values of a number of smaller wetlands, streams and indigenous vegetation and forest ecosystems. The ecological value of these habitats ranges from very low to very high when assessed for their representativeness, rarity and/or distinctiveness, diversity and pattern, and ecological context.[4] The application concludes that there are significant residual effects that

[4] Technical Assessment Appendix J.8.

cannot be avoided, remedied or mitigated, and proposes a range of biodiversity offsetting and compensation measures that aim to achieve an overall net gain in biodiversity in the local landscape as required by One Plan (Policy 13-4) and the PNRP (Policy P31).

33. As I understand it, the salient effects on, and response to, terrestrial and wetland biological diversity are (in summary):

(a) No significant indigenous-dominant forests or treelands lie within the proposed construction footprint and as such, the direct loss of such habitats is avoided. Effects that extend beyond the extent of the construction footprint into adjacent forest or treeland habitats are mitigated by buffer planting and dust control;

(b) Up to 5.36 hectares of other terrestrial vegetation or habitat for indigenous flora and fauna with low or higher ecological value may be lost (including all affected habitats assessed as significant), and is to be replaced through offsetting for net gain within 20-25 years;[5]

(c) Up to 3.84 hectares of wetland and open water habitat of low or higher ecological value may be lost (including affected wetlands assessed as significant), and is to be replaced through offsetting for net gain within 8 years;[6]

(d) Impacts on units of high value wetland vegetation are mitigated by moving the vegetation from the donor site into a less valuable recipient site (and offsetting the loss in extent though offsetting as above);

(e) Impacts on communities of vulnerable flora and fauna associated with the loss of habitat are potentially avoided by species translocations (lizards) and avoiding vegetation clearance during nesting (birds);

(f) Potential loss of individual specimens of vulnerable indigenous fauna that are unable to move out of the impact zone during

[5] Assessment J Table J.4a.
[6] Assessment J Table J.4b.

construction or subject to vehicle collision during highway operation are compensated through predator control within a wildlife sanctuary (snails and lizards), or mitigated by plantings that reduce bird interaction with vehicle traffic;

(g) The construction of a permanent barrier to the dispersal and migration of certain fauna is compensated for though improved ecological linkages arising from ecological offset, landscape and natural character plantings; and

(h) Increased edge effects are mitigated by buffering (infill planting) vegetation remnants adjacent to the proposed highway and minimising highway lighting.

34. I largely concur with the AEE, and the effects management responses proposed by Waka Kotahi. I have focused my report on outstanding issues, or matters which I consider warrant additional or more detailed consideration.

Habitat loss

35. Technical Assessment J, Table J2 presents a summary of the vegetation or habitat types that are present within the Ō2NL Project designation along with an assessment of their statutory significance.[7] In terms of the relevant policy, the significance assessment is consistent with my understanding of the relevant criteria set out in the One Plan and PNRP.

36. With regard to the NPSFM, I note that Technical Assessment J identifies all of the wetlands except open water ponds and their margins are 'natural inland wetlands'.[8]

37. I agree with this assessment except to add that the open water habitat specifically identified as "Open Water with New Zealand Dabchick" would meet the RMA definition of shallow water that supports a natural ecosystem of plants and animals adapted to wet conditions and the

[7] Project Technical Assessment J: pp 44-49.
[8] Project Technical Assessment J: pg 52, paragraph 164.

inland natural wetland definition of a wetland that is habitat for this threatened species.

38. With regard to systems already identified as natural inland wetland or assessed as not natural inland wetlands due to their construction status, the recent amendment to the NPSFM would not change the status. However, it may cause some pasture exotic grass-dominated wetlands that were previously assessed as not natural wetlands to now be captured under the definition if the pasture species are not those on the *National List of Exotic Pasture Species* list. Without further information to assess the type of pasture species within the application, I am unable to determine whether there are more pasture-dominated wet areas that may meet the revised definition.[9] In my opinion, these wet areas should be assessed against the new definition, and where necessary, the effects hierarchy in the One Plan and PNRP.

39. Table J.2 in Technical Assessment J identifies the amount of each vegetation type that lies within the designation and highlights what is within the currently proposed construction footprint. Table J.3 provides a synthesis of the potential ecological impacts on habitats within or adjacent to the proposed construction footprint, the ecological value of those habitats and the magnitude of effects.[10] Tables J.4a and J.4b set out the different categories of terrestrial vegetation and wetland vegetation types which are the subject of the proposed offsetting and compensation process.

40. On review of these tables, I do not consider Assessment J to be overly clear regarding the amount of habitat that will be lost to construction. For example, the amount of vegetation within the proposed construction footprint presented in Table J.2 is not completely synonymous with the "extent of removal" in Table J.3. Further, Table J.2 does not report that there is any ITT01 – kamahi-kānuka treeland within the construction footprint whereas Table J.3 indicates that up to 25% of this vegetation type may be lost.[11] This could be a function of the 20m construction

[9] See Technical Assessment J: Paragraph 69. This paragraph identifies that there are wetted areas where pasture grass species form greater than 50% cover and were not mapped. The "pasture species" are not listed.
[10] Project Technical Assessment J: pp 65-73.
[11] Pages 44 at row 9, and 66 at row 7, respectively.

buffer applied to the construction footprint,[12] although it is not clear that this is the cause of the difference. To confuse matters, Table J.4a and Table J.4b only account for habitats where the residual effects are "low" or higher, and thus does not (for instance) account for the loss of exotic habitats where the residual effects are very low or negligible.

41. Regardless, it is clear that there is an underlying “worst case” assumption that the reported extent of removal will be the full and final extent of habitat lost to construction (i.e. that the Ō2NL Project will result in total loss of habitat within the construction footprint). The models for determining the level of offset / compensation are scaled to this “worst case”. Scaling to this “worst case” scenario provides certainty for the effects assessment when the design itself is not certain. I agree with this process.

42. However, I note submitter concern that this approach could diminish/impact on application of the effects management hierarchy. The concern being that the proposed scale of offset response provides an opportunity to remove all habitat within the effects envelope in preference to avoiding the habitats during construction where possible.

43. I agree that the application could have been clearer as to how the effects hierarchy was addressed before resorting to offsetting/compensation for any residual effects and loss of significant habitats.

44. In some cases, application of the effects hierarchy is clearly evident through the technical work. The most obvious cases are the high value forest habitats that are intended to be avoided and the proposed conditions that seek to avoid the disturbance of nesting birds. More subtle is the proposal to instigate wetland soil transfers for high value wetland vegetation. This demonstrates that, where avoidance of the high value vegetation is not possible, mitigation of the loss (by moving it aside) has been considered before turning to offsetting.[13]

45. Other strategies are less obvious or even counter intuitive. For instance, it is possible that by grouping vegetation types together, condition RTE1

[12] Described at paras 36-37 of Technical Assessment J.
[13] See Technical Assessment J paragraph 13.

(Table RTE-1) gives scope for more loss of higher value vegetation types (say the high value IWFN1) over vegetation of a lesser value in the same group (say the moderate value MWFN1). This could result in effects that are greater than anticipated even though the same amount of wetland is lost (for example if more of the higher value habitat was lost to the benefit if the lower value habitat). In those circumstances, condition REM17 could be read as giving room to increase the offsets to balance the increased level of effect. Grouped habitats in Table RTE-1 could also mask effects where higher valued vegetation is grouped with lower valued vegetation namely; “Indigenous dominant fernland (wetland)”, “Exotic-dominant wetland”, and “Mixed exotic-indigenous wetlands”.

46. I have revisited Table J.3 in light of these issues. Some of my observations are below:

(a) On close examination of the potential extent of removal of "indigenous dominant fernland (wetland)” vegetation types provided in Table J.3 (being ITFn01, IWFn1 and MWFn1) the potential loss adds to 0.09 hectares. This is made up of an anticipated loss of 100% loss of 1WFN1 (0.01ha), 88% of MWFn1 (0.07ha loss) and 100% of ITFn01 (0.01ha). Yet, Table RTE-1 limits the total extent of loss for this group to 0.07 hectares. In this way, the condition constrains the collective loss of these vegetation types to below the anticipated loss for all three sites under the “worst case”, leading to the need to avoid the worst case in at least one of these sites in order to remain in compliance.

(b) Similarly, while MWSe4 might have a higher value for birds than given credit for in Table J.3, it is anticipated that 100% of this will be lost in contrast to the proportions of the other wetlands in the “Mixed exotic-indigenous wetlands” group. The allocated loss presented in Table RTE-1 does not add up to 100% of the habitats on the list, requiring the avoidance or only partial loss of MWSe4 in order to remain compliant.

(c) The only problematic set is the "exotic dominated wetlands", which groups a set of wetlands that are not considered rare or threatened under the One Plan (i.e. in Horizons' Region) with those (particularly vegetation units of (Paruauku swamp) that are significant under the PNRP (i.e. in Greater Wellington region). In my view, the wetlands should be grouped separately. I propose that the groups are split in Table RTE-1 to accommodate the different policy expectations. This will ensure that there is no opportunity to lose significant wetlands in favour of keeping less significant wetlands within the same group.

47. Also causing confusion are the differences between the ecological evaluation of habitats presented in Column 3 "Ecological Value" of Table J.3 and the ecological values presented for the same habitat types in the faunal sub-appendices.

48. Waka Kotahi was asked to comment on this as part of the request for further information by Horizons and GWRC (the "**RFI**"). Specifically:

> There appears to be an inconsistency between, (as an example) the high value of Kohekohe-titoki-karamu forest for lizards Table 4, Appendix J.6 versus a moderate value for the same forest reported in Table J.1a Appendix J.0. Is this apparent inconsistency as to the level of ecological value of habitats material to the magnitude of effects assessment and the degree offsetting required, material to the assessment?

49. Waka Kotahi stated in the Section 92 Response:[14]

> There is no inconsistency in the values. A habitat type may have a different ecological value when compared to the value of a particular fauna species. For instance, an area of vegetation could have a high ecological value based on its rarity and representativeness, but only a low to moderate value for fauna. …

50. I am not satisfied with this response. I accept that where the "Extent of Removal" is zero hectares (as is the case with the example cited in the

[14] Section 92 Response, item 17, pg. 8.

RFI), there is no habitat loss effect on fauna. It is also fair to say that the ecological value of a particular vegetation type is not just based on its faunal values. For instance, the conservation of rank grass and home gardens is not a biodiversity priority for those vegetation types in and of themselves. However, in the case of the Ō2NL Project habitats where specific faunal values are "moderate" or higher, I consider that the specific faunal values should have been used for the overall ecological value for the habitat. Without doing so, the assessment of the effects of the habitat loss potentially underestimates the level of residual effect on the fauna using those habitats.

51. I do not dwell on the discrepancies for vegetation types with zero extent removal or where the difference is a lower level of faunal ecological value than indicated in Table J.3. However, of habitats where removal is proposed:

(a) Sub-appendix J.5 at Table 6 identifies that ITF4 māhoe forest and scrub, and ITF5 and ITF6 planted indigenous forest are "high" value bird habitats (Table J.3 identifies these as "moderate" ecological value);

(b) Sub-appendix J.5 Table 6 identifies that IWFn1 bracken-whekī fernland, IWRe1 raupō reedland, IWSe3, IWSe4 and IWSe5 indigenous sedgeland on valley floor (Paruauku Swamp), MWFn1 kiokio-spike sedge-Yorkshire fog fernland, and MWSe4 pūrei-spike sedge-Yorkshire fog sedgeland on valley floor (Paruauku Swamp) are "very high" value bird habitats (Table J.3 identifies these are "high" or "moderate");

(c) Sub-appendix J.5 Table 6 identifies that OW open water is a "moderate to high" value bird habitat (Table J.3 identifies these as "moderate");

(d) Sub-appendix J.5 Table 6 identifies that TG1 gravelfield is a "very high" value bird habitat (Table J.3 identifies these as "moderate");

(e) Sub-appendix J.5 Table 6 identifies ETG1 rank grassland as "high" and home gardens (EHG) as "moderate-high" value for

lizards and that these habitats "…should not be undervalued as ecological habitats, as they can be important habitats for lizards, especially in highly developed landscapes".[15] Table J.3 identifies ETG1 and EHG as having "low" and "negligible" value respectively.

52. Reviewing these differences, I do not consider the difference in effect to be so great as to necessitate changes to the proposed ecological effects management package. However, bringing the faunal aspects to the fore highlights certain aspects of the effects management package that need further explanation, including:

(a) The residual level of effect on the forest birds that use ITF4 māhoe forest and scrub and ITF 6 planted indigenous forest rises from "moderate" to "high". This does not require an increased sensitivity to avoid these habitats nor an increase in the area of offset habitat to be planted. However, in my view, it does require a high standard of proof to be applied when demonstrating that the offsets will deliver functional bird habitats that replace what has been lost.

(b) The proposal to transfer wetland soils at specific sites mitigates the residual level of effects on the birds that use those habitats to "low". If these habitats are not re-created as and where proposed, it is my view that the residual effect on the birds using those habitats is "moderate". Increased offsetting to manage this effect may not be appropriate due to the vulnerability of the affected bird species. Therefore, the wetland transfers (or habitat restorations within the transfer site if it fails) are essential.

(c) The level of residual effect on birds using an open water habitat rises from "moderate" to "moderate to high". Considering that the amount of open water habitat construction that is proposed (seven hectares) is well in excess of that modelled to compensate for "moderate" effects (0.45 hectares), the proposal does enough to compensate for a change to "moderate to high"

[15] J.5 para 126.

effects. However, I note that achieving only the bare minimum (0.45 hectares) may not sufficiently compensate for the increased level of effect.[16]

(d) The "TBC" level of effects indicated for TG1 gravelfield, which is ranked as "very high" for birds translates to a "moderate" level of residual effect. Based on the reasoning and data presented by the Ō2NL Project ecology team, I am of the view that this warrants an offset. However, it might be that the magnitude of effect can be lowered to "negligible" if it is determined that the bridge pier design results in very small habitat losses. In which case, the level of residual effect is "low", and an offset response would not be necessary. It is possible to create new gravel habitat very near the point of impact through direct gravel transfer and/or weed control as proposed in the Section 92 Response. This would be preferable to creating similar habitat elsewhere because it results in an *in-situ* remedy of the habitat loss.

(e) The zero removal of indigenous forests and treelands and the exotic forest component of Arapaepae Bush is essential for avoiding effects on habitats ranked as "very high" for birds, lizards, bats and invertebrates. To remove any doubt about these habitats being avoided by the Ō2NL Project, I propose that these habitats be listed in proposed condition RTE1 with zero hectares as the maximum allowable loss.

(f) The residual level effect on the moderate to high lizard habitat values in the built environment can be managed to "low" as long as there are pre-construction clearance surveys. For this reason the proposed lizard sanctuary is not essential to managing the residual effects on individual lizards that may not have been discovered during the clearance survey (a compensation strategy). However, the lizard sanctuary does ensure that there

[16] The Biodiversity Offset and Accounting Model methodology uses area and indicators of habitat quality as the measures of effect and response. The models are not sensitive to or designed to respond to the "level of effect" itself and it is up to ecological experts to determine whether the offset / compensation is commensurate with the levels of effect based on experience and judgement.

is a safe place to transfer lizards into (a mitigation strategy) and if it did not exist, the residual effect on lizards would remain moderate or higher. The lizard sanctuary is therefore an essential component of an effects management package. Use of a sanctuary also demonstrates that the effects hierarchy is being followed.

53. In summary, even accounting for the "moderate" or higher faunal values reported in the sub-appendices, I am satisfied that the management of those effects is well scoped within the proposed effects management package. The description of the proposals/package follows the effects management hierarchy. However, care will be needed to ensure that conditions with a "where practicable" or "subject to" element to them do not provide incentives to defer to offsets before all opportunities to achieve the proposed avoidance and remedy/mitigation strategies have been exhausted.

54. I remain uncertain as to the level of effect on the TGI gravelfield habitat. I have calculated that the residual level of effect is "moderate", but as I note above, this could possibly be managed to be "low" through bridge pier design. I am confident that, by precluding any activity in the gravel beds during the nesting season, Condition RTE2 is sufficient to ensure the direct impact effects are adequately managed (although the wording in RTE2 should refer to gravelfield habitat not braided rivers). There is opportunity for a new gravel nesting habitat to be created near the point of impact and I am moderately confident that the habitat loss can be remedied with these measures.

Threatened fauna and flora

55. The assessments on fauna are comprehensive and I am satisfied that the effects on, and risks to, native fauna are sufficiently assessed through the AEE.

56. There are a raft of effects management requirements within the reports of the technical experts that are (or need to be) translated into consent conditions and/or standards within the proposed Ecological Management Plan ("**EMP**") that seek first to avoid, and then to

remedy/mitigate the effects. Higher than "low" residual effects are anticipated and these are managed through offsetting (where the effects relate to habitat loss), habitat buffering (where the effects relate to habitats adjacent to works), landscape and natural character planting (where the effects relate to collision avoidance and establishment of ecological linkages to mitigate the barrier caused by the road) and a wildlife sanctuary (to mitigate and compensate for losses of less mobile fauna).

57. The assessment of the impact of the Ō2NL Project on native flora is largely limited to the effects on indigenous vegetation and habitats, although Appendix J.3 briefly examines the potential for and effects on threatened flora. I largely agree with that assessment.

58. I agree that the common Myrtacea are listed as threatened due to the potential devastating impact of myrtle rust and are unlikely to become any more vulnerable to loss as a consequence of the Ō2NL Project. To further safeguard against potential effects, all new plantings of Myrtacea in the Ō2NL Project should come from nurseries that are certified myrtle rust-free. I have recommended a condition to this effect.

59. Ramarama (*Lophomyrtus bullata* – nationally critical) is also one of the listed Myrtacea, but in the instance of this species, it is also threatened by habitat loss. I note that the individuals recorded are identified as planted specimens and their presence is not indicative of a critical remnant habitat of the species. Ramarama is unlikely to become any more vulnerable to loss as a consequence of the Ō2NL Project

60. Poroporo (*Solanum aviculare* var. *aviculare*) is listed in sub-appendix J.2 (species list) but is presumably not within the construction footprint since it is not mentioned in Technical Assessment J,[17] and it is listed as being "unlikely" to be present in sub-appendix J.3.[18] This surprises me, as this nationally vulnerable shrub is reported as occurring in vegetation types ITF4 and ETF2,[19] which are affected by clearance.

[17] Technical Assessment J paragraph 115-117.
[18] Technical Assessment J.3. Table 2 page 12.
[19] Technical Assessment J.1 page 2 (ITF4) and page 28 (ETF2).

61. Poroporo is a fast-growing plant. Management of effects can be as simple as collecting seed from specimens that are within the construction footprint and sowing these into bare ground on the edge of restoration areas. As the species matures very fast (will fruit within 1 year of sowing), in my view 1:1 replacement of individuals lost would be adequate to ensure the Ō2NL Project does not exacerbate the vulnerability of this species. I recommend a condition for the 1:1 replacement of *Solanum aviculare var. aviculare*. This condition should apply across the construction footprint, not just ETF2 and ITF4 as I consider there is suitable habitat throughout the construction area.

62. Otherwise, I am satisfied that the management of effects on threatened fauna and flora is well considered. Subject to the addition of my recommended conditions, I agree with the effects management package as proposed by Waka Kotahi.

Dust

63. I have considered the effects of dust on vegetation. As long as dust is actively managed below nuisance thresholds, dust deposition is likely to be a minor effect.

64. Mr Stacey has made recommendations in his s 87F report to improve the way dust is managed to reduce nuisance effects. These recommendations are likely to assist with keeping dust effects on ecological values to a minimum.

65. I also note and support condition RAQ1 to check for dust deposition on plant surfaces of buffered forests (condition RTE7) and to respond by foliage washing.[20]

I. BUFFER PLANTINGS AND ECOLOGICAL LINKAGES

66. As identified in the AEE, the construction activity and use of the highway increases edge effects on existing habitats adjacent to the highway, and

[20] A methodology for this has not been established. This is a matter best left to an EMP to retain flexibility on methods.

disturbance of fauna and a perpetual threat of mortality of fauna living in those habitats. The new highway is also a significant barrier to migration and genetic exchange for less mobile fauna presently within the landscape.

67. The application maintains that these effects will be mitigated by buffer planting of vegetation remnants adjacent to the highway and minimising habitat fragmentation and isolation through suitable engineering and landscaping planting. It goes on to state that these "…actions are required to maximise potential habitat availability and connectivity for less mobile fauna…".[21]

68. The RFI sought to clarify this statement:[22]

> With reference to Para 205, Appendix J.0, how are the opportunities to maximise connectivity and quality to be implemented and is there a threshold of "maximise" below which the ecological mitigations are less than anticipated?

69. The Section 92 Response provided:[23]

> All natural areas within the Project are currently isolated from each other. The extensive natural character planting proposed for the Project provides connectivity through the establishment of corridors for wildlife. Connectivity will be further enhanced through the riparian planting that is proposed. In addition, buffer planting is proposed to 'protect' the high value forest remnants adjacent to the Project construction footprint. Together these measures result in connectivity that does not currently exist. Paragraph 205 in Technical Assessment J reflects the author's view that the measures proposed are appropriate, and "required to maximise potential habitat availability and connectivity.

70. This response confirms that the proposed measures (presumably all of the buffer, landscape and natural character plantings) are required to

[21] Technical Assessment J at paragraph 205.
[22] Response to Further Information Request, paragraph 21.
[23] Response to Further Information Request, paragraph 21.

maximise the potential habitat availability and connectivity and in doing so, manage the identified effects.

71. The need for buffer and linkage planting is further reinforced by the fauna experts:

(a) Sub-appendix J.5 (birds) identifies that buffer planting and linkage planting prior to construction are key measures that were considered when establishing the magnitudes of effects on birds.[24]

(b) Sub-appendix J.6 (lizards) identifies that the creation of new habitat in the vicinity of properties #479 and #465 is needed to reduce impacts on lizards.[25] Table 6.a of that sub-appendix identifies that the incorporation of lizard habitats into the landscape design is one means to reduce the very high residual effect of on-going disturbance on ornate skink down to "low".[26]

(c) Sub-appendix J.7 (invertebrates) identifies that the minimisation of direct mortality using infill planting along newly created edges of the Ō2NL Project alignment is a key minimisation measure considered in the magnitude of effects assessment.[27]

72. The buffer, landscape and natural character plantings are separate to the ecological offset plantings and yet are equally as important for mitigating the effects on fauna. Extensive areas of landscape and natural character planting and most of the buffer planting is on private land. Presently, the occurrence of buffer planting (Condition RTE7) and natural character planting (RWB3) is "subject to landowner agreement".

73. Logically, if buffer and landscape plantings are not implemented because landowners do not agree to them on their land, then the effects they seek to address are not mitigated as anticipated, leading to higher residual effects. With respect to the fauna that are classified as nationally critical, nationally endangered or nationally vulnerable, this

[24] At paragraph 70.
[25] At paragraph 116(k).
[26] At page 37.
[27] At paragraph 98(e).

could lead to adverse effects that are beyond the limits of offsetting due to species vulnerability. In this case, further offsets to compensate for reduced buffer and landscape planting may be an inappropriate response. Therefore, in my opinion, "zero" implementation of buffer, landscape, and natural character planting is not an acceptable outcome. For this reason, reliance on third party approval is of concern.

74. None of the experts appear to specifically identify a 10m buffer distance as the absolute minimum (as posed in Condition RTE7). Where there are existing roading effects such as a track or existing road close to the forest remnant, I think it is reasonable to assume that a narrower buffer between the remnant and road, or between the existing road and the construction footprint could still provide an improvement in habitat quality that mitigates the increase in traffic volume.[28] However, where the forest has not been subject to the influence of a road, it is my view that 100% achievement of the proposed buffer planting is important to mitigate both the additional edge effects (which include dust but also noise, light and vibration) and the increased risk that fauna emerging from the areas are harmed by vehicular traffic.

75. Again, the buffer plantings under RTE7 being subject to landowner agreement is of concern. Refusal of the plantings on private land could lead to a compromise on the level of mitigation anticipated. I also am concerned that the depth of the buffer is subject to the Ō2NL Project construction footprint when the effects assessment and mitigation is based on the footprint location as proposed in the application. In my view, the reference to landowner agreement and the construction footprint in Condition RTE7 should be deleted to provide certainty around the achievement of the mitigation.

76. Similarly, while the faunal experts identify the need to improve connectivity between remnants to mitigate the barrier to migration, there are few instances where critical linkages are identified. This gives the impression (based on the Section 92 Response) that all of the proposed landscape planting is necessary. Again, reliance on third-party agreement could lead to a sub-optimal outcome and it is my view that

[28] See the exception in RTE7(b)(iii).

reference to landowner agreement in Condition RWB3 be deleted to provide certainty around the achievement of the mitigation.

77. It may be that 100% of the landscape and natural character plantings are not essential to providing improvements in ecological linkages in a manner which reduces the effects down to the levels anticipated under the application. For certainty of outcome, and to show that the biodiversity effects management hierarchy is being adhered to, it would be helpful to explicitly identify how much and/or where buffers, landscape, and natural character plantings must be delivered to manage residual effects or loss of significant habitat to an acceptable level. The addition of buffers and landscape linkages to condition REM13 would also assist in providing the certainty needed.

J. OFFSETTING AND COMPENSATION

78. Waka Kotahi identifies that there are higher than “low” residual adverse ecological effects from the Ō2NL Project that cannot be avoided, remedied, or mitigated. As already noted, Waka Kotahi proposes to undertake ecological offsets and compensation to replace the loss of significant habitats and manage the residual effects. As the offsets are calculated to address significant habitats and the residual effects on less important areas where effects are greater than “low”, the size of the proposed offsets likely go beyond the policy expectations of the One Plan and PNRP.

79. Technical Assessment J supports the proposed offsets with comprehensive calculations for affected habitat types, applying the Biodiversity Offsetting Under the Resource Management Act ("**BOURMA**") guidance,[29] and with specific application of the Biodiversity Offset Accounting Model ("**BOAM**")[30] to guide the type and magnitude

[29] Biodiversity Offsetting Under the Resource Management Act – A Guidance Document, 2018. Prepared by Fleur Maseyk, Graham Ussher, Gerry Kessels, Mark Christensen and Marie Brown.

[30] Developed for the Department of Conservation, 2015, Prepared by Fleur Maseyk, Martine Maron, Richard Seaton, and Guy Dutson.

of revegetation. I support use of BOAM and BOURMA. I am also comfortable that the input metrics capture the essential ecological qualities of the habitats affected. This includes faunal food and use value in a way that is appropriate and commensurate to the type, scale, and intensity of impact on fauna as a result of habitat loss.

80. However, before accepting the veracity of the models, the first step is to determine whether offsetting or ecological compensation is appropriate in the first instance. Following the methodology of Pilgrim *et al*. (2013),[31] this in itself is a two-way process of establishing the level of conservation concern on one hand and the likelihood of offset success on the other (see Figure 2 below).

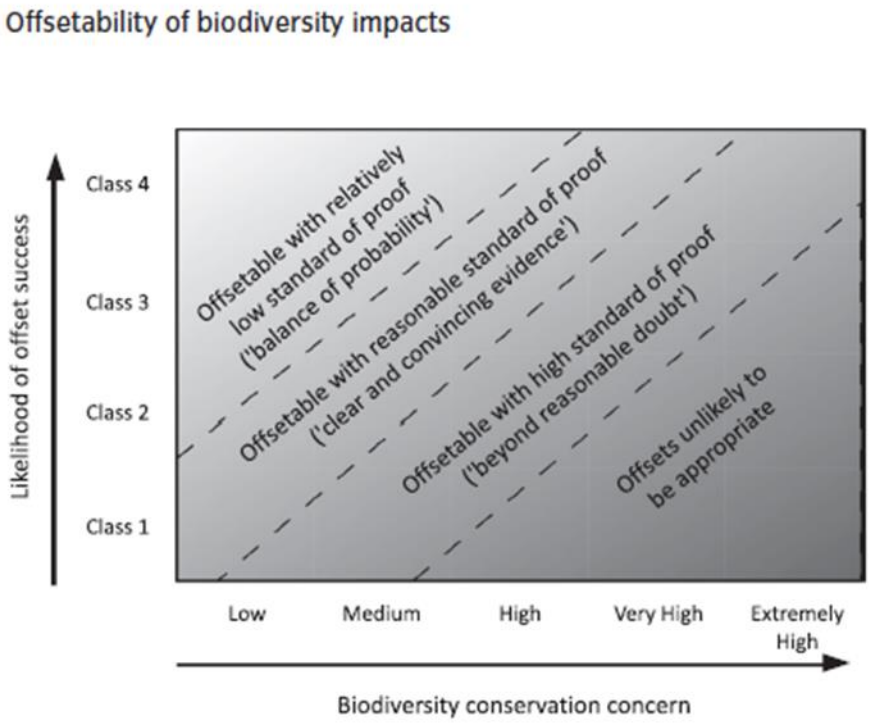

Figure 2 (from Pilgrim et al. (2013)). The offsetability of biodiversity impacts can be assessed by: firstly determining the level of conservation concern (x-axis) of a particular habitat based on rarity and vulnerability to further loss and; secondly establishing the likelihood of success (y-axis) following a classification system (laid out by the authors) that looks at magnitude and duration of effect, ease of offset implementation, and certainty of methods.

[31] Pilgrim, J. D., Brownlie, S., Ekstrom, J. M., Gardner, T. A., von Hase, A., Kate, K. T., Savy, C. E., Stephens R. T. T., Temple, H. J., Treweek, J., Ussher, G. T. & Ward, G. (2013). A process for assessing the offsetability of biodiversity impacts. Conservation Letters, 6(5), 376–384.

81. With regard to the level of biodiversity conservation (Fig 1; x-axis) concern, the application reasonably accounts for why the Ō2NL Project ecologists consider that none of the habitats affected within the Ō2NL Project construction footprint are irreplaceable.[32] This includes the wetland habitats subject to wetland soil transfer, as outlined in the Section 92 Response.[33]

82. I agree with this evaluation. Putting aside the vulnerability of some of the bird species that are using some of these habitats, and the need to follow the effects management hierarchy, it is my view that the sites are not so vulnerable that offsetting/ compensation would be inappropriate. This is because even the best sites consist of readily restorable communities of common native plant species.

83. Nevertheless, when considering the "high" to "very high" avifaunal values attributed to certain habitats, including that some of those avian values relate to threatened species, I am of the opinion that some of the areas of vegetation subject to removal or disturbance are of "high" to "very high" biodiversity conservation concern.

84. These vegetation types include each of the wetland types subject to wetland soil transfers (IWFn1, IERe1, IWSe 3, IWSe4, IWSe 5, MWFn1, and MWSe4). To this end, the transfers, which seek to retain the most valuable units of habitat near-*situ* are more akin to mitigation than an offset because it retains the habitat in close proximity to the species using it. Nevertheless, the loss of the extent of the lesser valued recipient site still needs to be offset which explains why the wetland biodiversity offset model includes the area loss of the lesser-valued wetland types. Also of high to very high biodiversity concern are the scrub and forests ITF4, ITF5, and ITF6. I am satisfied that the other habitats to be offset are of medium or low biodiversity concern.

85. With regard to the likelihood of offset success (Fig 1; y-axis), Waka Kotahi states that the feasibility of offsetting is high.[34] I agree that this is

[32] Technical Assessment J at paragraphs 295 – 299.
[33] At paragraph 19.
[34] Technical Assessment at paragraph 295.

the case for a number of reasons both cited and implied in Technical Assessment J. These include:

(a) Conditions to ensure that the habitats are not disturbed until it is established that the threatened fauna using those habitats have either moved on or have been translocated, means that the direct impact on fauna is low to negligible;[35]

(b) The affected vegetation types are relatively simple (i.e. consist of a few common species) so emulating those habitats through restorative planting is highly conceivable;

(c) There are established practices for rebuilding the affected habitat types and re-establishment of the signature vegetation can be achieved within reasonable timeframes. This includes the restorative planting of the transfer site should the transfers fail to establish high value vegetation;

(d) The recipient sites have, or can be induced to have, the environmental conditions that support the creation of new habitats in a like-for-like or better-than-like indigenous ecological condition;

(e) The Project Planting Maps indicate that there is sufficient room within the proposed designation to locate the proposed terrestrial forest, open water and raupō wetland offsets (and so these are not subject to third party agreement).[36] It has also been established that there is a high level of landowner agreement for wetland offsetting at Te Ripo o Hinemata. Also, condition REM13 provides that works cannot commence until landowner agreement is obtained. Therefore, landowner agreement is not a significant barrier to implementation.

86. While landowner agreement is not a significant barrier, the offsets help manage the perpetual effects on fauna. To improve the level of certainty

[35] Technical Assessment J at paragraph 295(c) states that no threatened fauna or flora will be directly affected. This is not the case for lizards where there remains a low risk of undetected individuals living in impacted habitats at the time of clearance.

[36] Planting Maps 310203848-01-700-C2000 to 310203848-01-700C2017.

that the ecological value will be retained in perpetuity, it would be useful if any landowner / occupier agreements require ongoing pest animal and pest plant management. To endure changes in tenure, this condition would need to be a covenant over the land. The condition would also need to extend over the designation where Waka Kotahi is the occupier.

87. When overlying the high to very high levels of conservation concern associated with avifauna habitat with the high likelihood of success, habitat losses are likely capable of being offset as long as Waka Kotahi can demonstrate to a high standard of proof that the offsets can be constructed to perform as modelled (refer to Fig 1; body). It is regrettable that the application was not accompanied by a draft EMP because that document could have provided a lot more certainty around the implementation of the offsets and verification of offset success. However, in my opinion, the ecological management package (including the proposed offsets) can achieve a net gain for indigenous biodiversity if the package is implemented as described by the Ō2NL Project ecology team.

88. With regard to the use of the term "compensation" used throughout Technical Assessment J, Mr Goldwater explains:

    (a) The proposed wetland and open water offsets trade the wet extent of poor-quality wetlands for improved condition in other wetlands and increased extent of open water margin wetland.[37]

    (b) "No net loss" of wetlands is not demonstrable in the short term.[38] Net gain is however demonstrable in the long term as indicated by the offset models.

89. I also identify a compensatory element in trading the loss of exotic-dominated seepage-type wetlands with a gain in indigenous-dominated swamp-type wetlands. They are not like-for-like in terms of wetland type. However, exotic-dominated seepages are a relatively common feature in pastoral farming landscapes in contrast to indigenous-dominated swamps, so it is my opinion that the trade is better-than-like.

[37] Technical Assessment J at paragraph 18.
[38] Technical Assessment J at paragraph 275.

90. There is a further compensatory element to the proposed 'wildlife sanctuary'. This is a trade for the potential unidentified loss of life of lizards and permanent barrier to dispersal and migration for lizards and snails with a potential gain in lizard and snail numbers within the sanctuary.[39] Because the number of lizards that may be inadvertently lost is not able to be known, the trade is not quantifiable, making this compensation. However, the collective opinion of the ecologists involved in the Ō2NL Project to date is that the overall biodiversity outcome is positive. I note that Mr Goldwater emphasises that the construction of a predator proof fence is not strictly needed.[40] I disagree. The sanctuary not only compensates for lizard losses but also perpetual effects. If the fence is not constructed, then in my view the predator control within the transfer site should be perpetual to provide a commensurate period of protection. The fence provides more certainty for enduring predator management.

91. When considering these compensatory aspects, it is my view that the trades will ultimately lead to better-than-like biodiversity outcomes with net gains achieved through the increased extent of indigenous-dominant habitats and greater numbers of native fauna. While some of these outcomes are not quantifiable, I do not consider them to be inappropriate. I am of the opinion that they are commensurate with the scale and magnitude of the effects that they seek to redress.

92. In conclusion, I am comfortable that none of the affected habitat types are so vulnerable as to be irreplaceable. Offsetting remains appropriate as a response to managing the residual effects of habitat removal subject to the effects hierarchy having been implemented – that is, all of the other proposed measures to avoid, remedy, and mitigate effects are also in place as part of delivery of the Ō2NL Project.

93. In my opinion it is appropriate to rely on conditions and the EMP to ensure that the hierarchy is being followed. In the absence of a draft EMP, the conditions must be sufficiently detailed to ensure delivery of the outcomes that Waka Kotahi promises as part of the effects

[39] See Technical Assessment J at paragraphs 305-313.
[40] Technical Assessment J at paragraph 312.

management package. This includes requiring application of the effects hierarchy in its totality. One approach to incentivise the hierarchy is to provide for a scaling down of the size of habitat offsets if less habitat is lost than posed under the "worst case" provided in condition REM17. Mr St Clair has also recommended a change to condition REM19 to provide more certainty around the measurement of the offsets to check that they are delivering net gain. I support that recommendation.

Te Ripo o Hinemata

94. Te Ripo o Hinemata is a large area of ecologically compromised (drained and weed-infested) wetland in the Koputaroa River (Manawatū River) catchment, approximately 8km northeast of Levin.[41] The site is posed as the recipient site to offset the loss in extent of the combined loss of 3.31 hectares of wetland.[42] The land is owned by the Manawatū Kukutauaki No. 3 Sec 2E Trust (the kaitiaki of the wetland).

95. As documented within Technical Assessment J, Te Ripo o Hinemata:

    (a) Lies withing the Manawatū Ecological District and is generally in the same ecologically relevant area and setting as most of the affected wetlands.[43]

    (b) Is dominated by non-indigenous vegetation.[44]

    (c) Is hydrologically compromised.[45]

    (d) Is subject to a plan for full restoration formed by the kaitiaki but they lack the resources to achieve that vision.[46]

96. On 21 September 2022, I visited two potential recipient offset sites accompanied by Mr Goldwater and representatives of the Manawatū

[41] Using GIS, I calculate the overall area of wetted and wettable extent within the Manawatū Kukutauaki No. 3 Sec 2E to be at least 13 hectares.
[42] Technical Assessment J at paragraph 291 lists the wetland types and paragraph 294 confirms the offset intent of approximately 9 hectares located at Te Ripo o Hinemata.
[43] Technical Assessment J at paragraphs 253-255.
[44] Request for Further Information at paragraph 15.
[45] Implied in the Request for Further Information at paragraph 15.
[46] Technical Assessment J at paragraph 321(c).

Kukutauaki No. 3 Sec 2E Trust. These sites are known to Horizons as "Koputaroa Swamp 3" and "Koputaroa Rail Wetland" (see Figure 3).[47]

97. "Koputaroa Rail Wetland" is synonymous with Te Ripo o Hinemata and lies to the east of the North Island Main Trunk rail corridor between the rail corridor and the left bank of the Koputaroa Stream (refer to Figure 3; Section M). The wetland is perched above the stream but is subject to inundation from the Koputaroa Stream, as well as having internal perennially flowing springs which give the wetland a swamp character. The site is recorded in Horizons' wetland inventory and is regarded as being poor both in terms of the hydrological state and wetland vegetation condition.[48] Mr Goldwater identifies that approximately 9 hectares of the site will be subject to hydrological reinstatement, planting and pest management.[49]

98. "Koputaroa Swamp 3" lies to the west of the rail corridor (refer to Figure 3: Section M). While not synonymous with Te Ripo o Hinemata, the site is also subject to the wetland restoration aspirations of the kaitiaki. After a visit circa 2004 to assess the site's condition, it was considered by Horizons as 'lost' due to the lack of any indigenous signature and the high degree of drainage (it does not appear in the inventory for that reason). I note that the site is possibly wetter today than when assessed in 2004 due to cessation of drain maintenance. The site is subject to runoff from the higher land to the east and there are internal springs that cause the site to be quite boggy in places away from the drains. Presently, the character is more like "marsh" wetland, but this is due to drainage patterns. A "swamp" character could be induced by infilling the drains and letting the water meander through the site. I calculate that there is conceivably 5.7 hectares of land managed by Manawatū Kukutauaki No. 3 Sec 2E Trust that could be readily restored to indigenous-dominated swamp habitat through drainage manipulation and native vegetation planting.

[47] Horizons Rapid Ecological Assessment wetland inventory data provided by Horizons 21 February 2019.
[48] Lambie; 2008. Revised Regional Wetland Inventory and Prioritisation. Horizons Regional Council report 2008/EXT/892.
[49] Technical Assessment J at paragraph 294.

99. In my view, both sites have the capacity to emulate the hydrological regime and indigenous vegetation sequences that are present in the swamps affected by the Ō2NL Project to result in like-for-like or better-than-like outcomes. As stated above, I consider the trade in exotic-dominated "seepage" wetlands for restored indigenous-dominated "swamps" to be fair and results in better-than-like biodiversity outcomes.

100. It is my understanding that the restoration of both or either of these sites would require resources far beyond the capacity of the sites' kaitiaki. This was confirmed in informal discussions with them while on site. Overall, I am of the opinion that the proposal to offset effects by restoring the hydrology and vegetation to Te Ripo o Hinemata would not be foreseeably achievable without Waka Kotahi's involvement.

101. Both sites lie within the extent of Horizons' Koputaroa Drainage Scheme. The drains within the sites do not appear to be scheme drains[50] and I am of the view that hydrological and vegetation restoration can be achieved without compromising the integrity of the scheme. However, this view is only formed from the opinion that blocking internal wetland drains is unlikely to affect upstream owners. It is not informed by hydrological survey and modelling. There may also be consenting requirements for the change to the hydrological settings of the drains within the scheme boundary.

102. Nonetheless, I am of the opinion that Te Ripo o Hinemata and/or "Koputaroa Swamp 3" are ideal candidate sites for ecological offsetting of the wetland effects described by Waka Kotahi. Both are larger than the 4.65 hectares presently modelled for the offset of the loss of wetland habitat. My opinion is limited to ecological matters and does not reflect any opinion regarding the natural character of the affected wetlands.

Examining the proposed offsets and compensations under Horizons' One Plan

[50] Refer to Horizons' "Koputaroa Drainage Scheme Map" available on Horizons' website at: https://www.horizons.govt.nz/HRC/media/Media/Koputaroa-drainage-Scheme.pdf?ext=.pdf.

103. The limits to offsetting under the One Plan are prescribed in Policy 13-4. In particular, Policy 13-4 (d) requires that an offset must:

> (i) provide for a net indigenous biological diversity gain within the same habitat type, or where that habitat is not an area of significant indigenous vegetation or a significant habitat of indigenous fauna, provide for that gain in a rare habitat or threatened habitat type, and
>
> (ii) reasonably demonstrate that a net indigenous biological diversity gain has been achieved using methodology that is appropriate and commensurate to the scale and intensity of the residual adverse effect, and
>
> (iii) generally be in the same ecologically relevant locality as the affected habitat, and
>
> (iv) not be allowed where inappropriate for the ecosystem or habitat type by reason of its rarity, vulnerability or irreplaceability, and
>
> (v) have a significant likelihood of being achieved and maintained in the long term and preferably in perpetuity, and
>
> (vi) achieve conservation outcomes above and beyond that which would have been achieved if the offset had not taken place.

104. As identified above, there is a compensatory element in trading the loss of exotic-dominated seepage-type wetlands with a gain in indigenous-dominated swamp-type wetlands. As it was written prior to the guidance for biodiversity offsetting under the RMA,[51] where the distinction between "offsetting" and "compensation" is drawn, the One Plan does not have specific limitations on the use of biodiversity "compensation" as a means of reducing residual effects. In my view, whether "compensation" is appropriate in this case depends on how well the compensation satisfies Policy 13-4 (d)(i). As the exotic-dominated

[51] Maseyk, F.; Ussher, G. Kessels, G. Christensen, M. and Brown, M. (2018); Biodiversity Offsetting under the Resource Management Act: A guidance document. Prepared for the Biodiversity Working Group on behalf of the BioManagers Group (a collective of Local Government New Zealand).

seepages are all types that are not identified as significant under One Plan Schedule F,[52] Policy 13-4 (d)(i) is met. With respect to the loss of the indigenous-dominated wetlands that are also grouped into Te Ripo o Hinemata package, these are swamps and so Policy 13-4 (d)(i) is met. With regard to forest and treeland systems, the trade is like-for like and so Policy (d)(i) is met.

105. I also consider Policy 13-4(d)(ii) is met. The modelled offsets reasonably demonstrate net gain using metrics that are commensurate with the anticipated types of and scales of effect.

106. As identified above, Te Ripo o Hinemata offset site lies within the same ecological district as most of the affected wetlands. The forest and treeland offset sites are also in the same ecological district as the affected sites. This is a very general level of ecological relevance. Ideally a wetland ecological offset would be located in the same catchment (for aquatic species) or close enough for birds to readily exchange the use of the offset site for the loss of the original site. However, noting that the intent is to offset the loss of the most faunistically valuable wetlands in close proximity or adjacent to the affected site,[53] it is my view that Policy 13-4 (d) (iii) can be regarded as being suitably met.

107. As I have noted earlier, offsetting is appropriate after considering rarity, vulnerability and replaceability. Given my conclusion that the offsets have a significant likelihood of being achieved and will achieve biodiversity outcomes greater than what might be expected without the offset policies 13-4 (d) (iv-vi) are also met.

Examining the proposed offsets and compensations under GWRC's PNRP

108. For the Greater Wellington region, the only affected habitats are associated with the wetland identified in Technical Assessment J as Paruāuku Swamp. The wetland is specifically listed in Chapter 12 Schedule F3 of the PNRP as the Otepua-Paruāuku wetland. Policy G2

[52] As listed in Table J.2 of Technical Assessment J.
[53] See Technical Assessment J, paragraph 226 (which also refers back to paragraph 221).

provides the principles to be applied when proposing and considering a biodiversity offset.

109. In the first instance, the most floristically valuable wetland units of the wetland are the subject of wetland soil transfers as part of the effects management proposal. The wetland transfers retain the better value wetland habitat and wetland character near-*situ* as much as can be reasonably relocated into the catchment without impinging on habitat of greater value nearby. As already indicated, I consider that the transfers are more like a mitigation than an offset (although consideration must be given to the residual effects of the loss of the less important unit into which the transfer takes place). In this regard, I consider the effects management hierarchy has been adhered to as far as practicably possible, given also that the Ō2NL Project alignment has sought to avoid areas of even higher ecological value. Schedule G2(1) is therefore met.

110. As identified above, the affected vegetation is relatively simple. If the transfers fail to establish vegetation of better quality than what is already present within the recipient sites, it can be readily restored, in my view. After this activity has taken place, there is the residual adverse effect in the form of the loss of extent. This itself is proposed to be offset at Te Ripo o Hinemata, which as I explain above, can adequately offset this loss. Schedule G2(2) is therefore met.

111. I have already identified that the offset has a significant likelihood of being achieved and in doing so, will achieve biodiversity outcomes greater than what might be expected without the offset. Schedule G2(3) is therefore met.

112. The wetland transfer proposal has given preference to mitigation/offsetting at the site before resorting to off-site recipient areas. In my view, there is very little room within the catchment to undertake further wetland offsets and so an off-site offset is needed to adequately address the loss in extent. Schedule G24(a) limits the scope of the biodiversity offset to the same ecological district. As Te Ripo o Hinemata is in the same ecological district and the proposal accounts for the intended development of that land, this recipient site is appropriate. I also consider Schedule G2(4) is met.

Managing the effects on the natural character of the wetlands

113. The ecological value expressed in Table J.2 of Technical Assessment J is also a direct expression of the biophysical value of the natural character of the wetlands. It follows that the biophysical natural character inherent to affected wetlands can be emulated through the offset proposal at the offset sites.

114. However, this approach does not deal with the experiential qualities of natural character at a site. As Ms Williams points out in her s 87F report: [54]

> …by definition, natural character (or at least the landscape component of natural character) is site-specific and relies on the perceived naturalness of the river/stream/wetland landscape that can be viewed from the highway, bridges and the shared use pathway. Offsetting therefore does not and cannot mitigate perceived effects on natural character.

Ms Williams goes on to state: [55]

> Further an offsetting approach does not address the Regional Councils' effects management hierarchy for natural character to avoid, remedy or mitigate.

The implication is that the effects on wetland natural character should be managed *in-situ* or near-*situ* as far as practicable.

115. As noted above, some wetlands will be the subject of the transfer of wetland soils. In my opinion, the occurrence and effectiveness of these mitigations must not be subject to landowner agreement or a "where practicable" proviso. This is because:

(a) It is the only way to remedy/mitigate the effect on the high level of natural character in these sites. The offset site at Te Ripo o Hinemata cannot serve this purpose because it involves a different wetland;

[54] Section 87F Report, Natural Character, Julia Williams, at paragraph 55.
[55] Section 87F Report, Natural Character, Julia Williams, at paragraph 56.

(b) It mitigates effects on the fauna using those habitats. The offset site at Te Ripo o Hinemata cannot serve this purpose due to distance; and

(c) It retains near-*situ* (closer to "mitigation" than "offset") the high value character within the wetland hydrological system / catchment that it is set. It therefore represents a clear intent to follow the effects management hierarchy.

116. The only situation where a "where practicable" approach may be reasonable is where, on actual operation, it is found that it is not safe or feasible to undertake the direct transfer of the vegetative material from the donor site as proposed. Otherwise (if this is not practicable), like-for-like vegetation type should be re-constructed through planting at the site (as opposed to further offsetting elsewhere).

117. The indicative planting maps portray landscape planting or natural character planting that involve restoration of wetland vegetation that is within the same catchment and as close as practicably possible to wetlands being lost. A lot of this planting appears to fall inside the designation, and so there is little to no risk of non-implementation given the requirements of conditions RWB3 and DVL1. In that case the plantings proximity to the effect within the proposed designation satisfies me that loss of the natural character of the affected wetlands is capable of being mitigated or potentially improved though near-*situ* restoration of indigenous-dominant wetland habitat.

118. However, there are instances where the planting is proposed to occur outside the designation. I am less convinced that these plantings will lead to the mitigation of the biophysical loss of natural character on adjacent wetlands. This is either because the planting is subject to landowner agreement, or because the indicative planting maps do not appear to address the loss. The affected wetlands are:

(a) IWRe1 at approximately Chainage 11050. While there appears to be sufficient room within the designation to undertake the ecological offset in the same catchment, this is only to the extent that the habitat can be replaced achieving biodiversity net gain

as modelled. The mitigation of effects on natural character appears to require a greater area which is outside the designation.[56] This is coupled with 6 hectares of terrestrial offset planting (mostly) outside the designation.

(b) MWG3 (W58) near Chainage 20600. While Technical Assessment J Table J.3 indicates restorative planting of remaining wetland (roughly half of which is in the proposed designation),[57] planting map Sheet 8 does not indicate any such planting. Therefore, it is difficult to ascertain if the natural character loss will be mitigated near-*situ*.

(c) MWG1d near Chainage 28200. About half of the riparian planting proposal that overlays these sites is outside the proposed designation.

(d) EWG 1-9 etc. near CH 28500 – 28600. The wetland restoration component indicated in the planting map is largely outside the proposed designation.

(e) Wetlands adjacent to Waiauti Stream. All of these are captured in a riparian freshwater offset planting proposal. There appears to be sufficient room within the proposed designation to undertake the ecological offset. However, whether the effects on natural character are also mitigated will depend on whether the full extent of riparian planting (which includes planting outside the designation) is needed to mitigate effects.[58]

(f) The wetlands around Chainage 33600 to 33900 (in the Greater Wellington region). The raupō wetland restoration / offset indicated up stream deals with the near-*situ* need for ecological mitigation. About two-thirds of the offset site is within the proposed designation and, coupled with the slivers of natural character and landscape planting that are also within the proposed designation, it is highly likely that ecological outcomes – that are a vast improvement on present condition – can be

[56] Technical Assessment D at paragraph 204.
[57] Technical Assessment J at page 70.
[58] As described in Technical Assessment D at paragraph 275.

achieved. However, Waka Kotahi has described mitigation as part of the wider package, including much which lies outside the proposed designation.[59]

119. While I agree with the intention behind the proposed outcome – being an *"…overall landscape outcome that is greater than the sum of the parts"*[60] – it difficult to ascertain whether non-implementation of plantings outside the proposed designation compromises the efficacy of the natural character mitigation offered as part of the Ō2NL Project. Also, some of the sites in question (notably the raupō offset site and Waiauti Stream plantings) offer substantial ecological linkages that serve not only to mitigate effects on wetland natural character but also effects on fauna. Again, it would be of concern if the connections (relied on in the application for effects management) were not delivered due to the absence of third-party landowner approvals.

120. To that end, I am of the opinion that there are priority areas of natural character and landscape planting occurring outside the proposed designation that are of paramount importance to mitigating the effects on wetland natural character. The consent conditions for these sites should not be subject to landowner agreement. My preference would be for legal authorisations to be secured before the works are able to commence, similar to the approach in conditions to the offsetting proposals.

K. CONDITIONS

121. I set out below my concerns or suggestions in relation to Waka Kotahi's proposed condition set.

RTE Conditions (Terrestrial ecology)

122. The need to avoid loss of specified indigenous forests, treelands and Arapaepae Bush should be made clear within the conditions. I recommend these habitats are listed in Table RTE-1 with an indication that loss of extent is to be avoided. With respect to condition REM12 and elimination of exotic tree weeds from Arapaepae Bush, I am of the

[59] Technical Assessment D at paragraph 283.
[60] Technical Assessment D at paragraph 7.

opinion that the disturbance of that vegetation can be effectively managed through the EMP. There may, however, need to be some provision in the conditions to provide for it if the vegetation becomes subject to zero loss under condition RTE1.

123. In table RTE-1, the habitat type "EDW" (exotic-dominated wetland) is used as an umbrella term for all exotic-dominated wetland types. This term is not identified in the Ecology Plans,[61] and the plans still show each of the different exotic-dominated wetland types. Also, as I have noted above, the significant exotic-dominated wetlands of Paruauku Swamp need to be split from the non-significant exotic-dominated wetlands to ensure there is no more loss of the significant wetlands than is already anticipated. In my opinion, the individual wetland vegetation types (by vegetation unit code, as used for other vegetation types) for exotic-dominated wetland should be listed in the habitat type reference column of Table RTE-1.

124. The "ITF4" habitat shown on the Ecology Plans appears to only be concerned with māhoe forest and scrub. However, in Table RTE-1, the limitation on vegetation clearance (presumably) applies to the 2.85 hectares of māhoe dominant indigenous forest and scrub accounted for in the BOAM – which includes not only ITF4 but also anticipated losses ITS1, ITS1d, MTS4 and MTF6d. If this is the case, I am of the view that all of these habitats/vegetation need to be referenced in the habitat type reference column of Table RTE-1.

125. RTE1(b) presently provides that, prior to removal of wetland habitat in Table RTE-1, the area of wetland to be removed must be delineated physically or through digital mapping from the wetland that is to be retained. In my view, this statement should be clarified to ensure that it does not detract from (and that the EMP captures) the intent expressed in Assessment J Table 3 for 'physical delineation to ensure no clearance of trampling of habitat that is to be retained'. This requirement of Assessment J, Table 3 applies to all wetlands, and several forest types

[61] The Ecology Plans referred to in the condition set are those included in the '*Notices of Requirement for a Designation and Application for Resource Consents'* dated 1 November 2022 *'Volume III Drawings and Plans'*.

(including some not listed in Table RTE-1 due to exotic dominance or avoidance) and in my view, must be adhered to.

126. Equally, the requirements of RTE1(c) should cover all of the habitats in Table RTE-1 (not just ITF4), and also include several other types that are not listed in Table RTE-1 (including those where Assessment J Table 3 identifies the need for 'physical delineation to ensure no clearance of trampling of habitat that is to be retained').

127. RTE2 should cover the relevant habitat as described in Technical Assessment J (gravelfield habitat) instead of "braided river" which is not referred to in the technical reports.

128. For RTE4, there should be a contingency plan for when compliance with mow heights cannot be achieved due to unforeseen events, with a view to ensuring birds are not affected (e.g. a site walk over if the height is above a threshold and it is breeding season, undertaken prior). I do not consider it necessary for the grass length to be specified as "between" 150mm and 200mm within the condition. If the intent of the condition is to discourage pipit from nesting, then, it is my view, that a simple restriction of the grass being "no higher than" 200mm would be sufficient.

129. As discussed earlier in this report, the indigenous buffer planting referred to in RTE7 must not be subject to landowner agreement. It is my opinion that these buffers are essential to ensuring that the residual effect on adjacent forests is mitigated to "low".

REM Conditions (Ecology management, offset, and compensation)

130. The species listed in REM4 should be controlled in the manner described in that condition. However, in my view, it is necessary to consider all of the pest plants that could be spread by the activity. This includes unwanted organisms listed in the Official New Zealand Pest Register that are present in either region or any other regions where machinery is arriving from, and any exclusion, eradication, and progressive containment (where the activity is occurring outside the

containment zones) pest plants that are listed in the relevant Regional Pest Management Plans ("**RPMPs**").

131. Of particular concern is the further spread of field horsetail (*Equisetum arvense*) through gravel resources and yellow bristle grass (*Setaria pumila*) which can be spread by mowers. Also, in my opinion, the plants recorded in Assessment J[62] need to be referred to within REM4, including pampas (*Cortaderia* spp), radiata pine (*Pinus radiata*), gorse (*Ulex europaeus*), barbery (*Berberis glaucocarpa*), blackberry (*Rubrus fruticosus* agg.), and tutsan (*Hypericum androsaemum*).

132. Further, REM4 should specify that all new plantings of Myrtacea undertaken as part of the Ō2NL Project must come from nurseries that are certified myrtle rust-free.

133. Without having an EMP yet there is no "framework for the management of indigenous vegetation, habitats and fauna" and so REM5(a)(ii) lacks certainty, context, and scope around the immediate course of action. As a minimum, the immediate course of action should be the cessation of works in the area of the affected fauna or flora pending the outcome of the ecological investigation based on clauses REM5(a)(i) and (iii).

134. REM6 lacks a time period within which all offset plantings will be completed. In order to increase the certainty of this condition (and its ability to secure an offset), I recommend that a deadline for completion of the work is included. This date could be linked to the commencement of works on the Ō2NL Project; however, this would not provide for staging. It would be good for staging to be included. The staging of planting, and when and how it is measured, may require further discussion between experts going forward.

135. I understand that the empty cell in the left column of Table REM-7 should be merged with the row in the column above, and that this is not simply missing information. In that cell, I recommend that the word "exotic" be added to "riparian forest, scrub, and vineland" to be consistent with the wording used in the BOAM. The 0.42 hectares of BOAM response for

[62] Technical Assessment J at page 58, paragraph 192.

the loss of 0.4 hectares of exotic riparian forest, scrub and vineland also needs to be added to the right column of Table REM-7.

136. REM7 needs to have a contingency measure to accommodate the remedy response to habitat TG1 (gravelfield) if needed.

137. Given its conservation status, poroporo should be listed for replacement where individuals are lost to construction, on a 1:1 basis. Success should be assessed across restorative planting sites where seed has been sown, in accordance with REM19. This may be able to be accommodated within condition REM8.

138. The 0.25 hectare replacement of 0.12 hectare loss of raupō-dominated habitat must be required to be provided by way of a condition. While it is more of a "mitigation" than an offset, it maybe be appropriate for inclusion in Table REM-9.

139. Also in relation to Table REM-9, while they are mitigations, the wetland soil / near-*situ* wetland restoration proposals should feature in this condition (i.e. they are restorative mitigations that are in addition to the offsets). The condition title will need to be reworded to be inclusive (perhaps "wetland restoration mitigation and offset").

140. For REM7, REM8 and REM9, these conditions need to state that the material is to be sourced from the rohe in which it is planted (see, for example, RTE7(b)(v)).

141. REM12 needs to cross reference to REM9, as well as the existing cross-references. Given this includes habitat loss mitigation planting, the title of the condition need to change to be inclusive of that.

142. REM14 should require certification of the Ecology Offset Site Layout Plans and any amendments to those plans. Presently they only have to be provided to the regional councils for information purposes, however, the plans are key to delivering the offsetting measures for the Ō2NL Project, and oversight is required.

143. To incentivise avoidance over offsetting, REM17 should allow for a reduction in the recalculated area as a result of avoiding the relevant habitats through design.

144. In relation to REM19(a), monitoring report dates set at “the third and fifth” year “following the completion” of planting are potentially unclear given planting is to be completed in stages across multiple years. In my experience, similarly worded conditions from the recent Te Ahu a Turanga project has also caused some confusion. One approach would be to undertake an annual performance check across all sites.

Other conditions

145. For reasons I have explained, where plantings referred to in RWB3 are required to mitigate the local effect on the natural character of wetlands or provide for improved ecological linkages, they should not be subject to approval of landowners. Deletion of the reference to landowner permission and/or refinement to this condition to refer to the arrangements set out in REM13 would ensure that the planting will be undertaken.

146. The performance standard RWB3(a)(ii) should be revised to be consistent with the performance standards for terrestrial and wetland offsets (as appropriate for the type of habitat being planted). The terrestrial match was provided in the Waka Kotahi March letter, but the wetland match was not specifically addressed.

147. The performance standard DLV1(b) should be revised to be consistent with the performance standards for terrestrial and wetland offsets (as appropriate for the type of habitat being planted). The terrestrial match was provided in the Waka Kotahi March letter, but the wetland match was not specifically addressed.

148. In Schedule 7, I consider that a greater level of specification in the EMP is required around the approaches to the removal of wetland and forest habitats. This will better provide for the assessment of compliance with conditions regulating those removals.

149. Schedule 7 could also require that the EMP describe contingencies for minor non-compliances caused by unforeseen events. For example, the pipit nesting issue caused by mowing being delayed. These contingencies may not need to be captured in Schedule 7 if they can be adequately recorded elsewhere.

L. SUBMISSIONS

150. I have read the submissions containing reference to matters of terrestrial and wetland ecology. I have also read the submissions that reference vegetation planting as a mitigation for noise, dust and other effects and the equestrian submissions that request a grass berm along a multi-use pathway.

151. The submissions of relevance to my review are submissions: 1 (Ben Summers), 8 (Wendy McAlister-Miles and Don Miles), 11 (Adam and Joanne McCallum), 12 (Josien Reinalda), 22 (Glenys Anderson), 24 (Anita Lenaghan), 25 (Maria Storey), 29 (Martyn Vause), 32 (Ruth Halliday for the Kapiti Equestrian Advocacy Group), 40 (Rochelle ad Matthew Apatu), 41 (John and Jenny Brown), 48 (Kevin Daly), 49 (Karen and Stephen Prouse), 51 (Rebecca Wilson), 53 (Lindsay Poutama), 55 (Nicola Robinson), 59 (The Fish and Game Council), 62 (The Royal Forest & Bird Protection Society), 67 (The Horowhenua District Council), and 71 (Sarah Hodge).

Submissions 1, 8,11, 22, 29, 40, 48, 49, and 71

152. I have grouped these submitters as they all refer to mitigations for noise, dust and/or visual amenity effects including the use of vegetation screening or bunding that may interact with the proposed planting layout plan.

153. No submitters appear to be against the use of indigenous vegetation for this purpose and so their requests are compatible with optimising the potential indigenous biodiversity outcomes for the Ō2NL Project. I have checked the proximity of the submitters in relation to the vegetation layout designs. In most instances, there is no or very limited proposed planting in their location and therefore a non-vegetation or non-native vegetation-based solution to their concerns is unlikely to negatively impact the biodiversity outcomes of proposed planting.

154. With respect to the bund recommendations of Mr Daly (submission 48), a bund would not necessarily lead to poorer biodiversity outcomes because the vegetation proposed is dry land vegetation and would grow on an earthen bund. With respect to the Prouse property (submission

49), a vegetative solution would be desirable from an ecological point of view. I comment on the faunal aspect of the Prouse's submission below.

155. I do not comment on Ben Summers' (submission 1) concern about an increased risk of avian-vectored disease as I am not an expert in that field. I note that the proposed open water wetland is approximately 3km southwest of his property.

Submissions 24, 32, 44, 51, and 55

156. I have grouped these submitters due to the request for a multi-use pathway for equestrians, including a request for 1m grassed berm. Assuming that this would require a wider pathway than presently proposed for shared use, this would likely result in less hectarage of indigenous tree planting and potential sub-optimisation of the indigenous biodiversity outcomes for the Ō2NL Project.

157. The effect of a wider pathway is likely to be minimal except where it crosses through or adjacent to areas marked specifically for ecological (terrestrial, wetland, and aquatic) avoidance, remedy, mitigation and/or offset. It is my view that management of ecological effects should take precedence in the circumstances. For the offset sites, any resulting reduction in the proposed native vegetative extent would need to be accounted for in another place that is contiguous with the proposed offset areas.

158. Otherwise (i.e. for the landscape and natural character planting that might otherwise maximise biodiversity benefits), I do not consider the request significantly undermines the intended positive biodiversity outcomes of the Ō2NL Project. However, my comments are limited to ecological matters only.

Josien Reinalda

159. I agree that effects on rare or threatened habitat types that trigger the One Plan non-complying status should be considered on a case-by-case basis, with effects to be avoided wherever possible. I am satisfied that the Applicant has looked at the effects on a case-by-case basis. I have identified minor tweaks to Proposed Condition RTE1 to ensure that

habitat groupings do not give scope for greater losses than already anticipated on the case basis. I note too that there is incentive to reduce the losses to less than posed in RTE1 through REM17 which (potentially) provides for smaller offsets if less area is removed.

Maria Storey

160. I agree that there is a significant gap with respect to how pest plants and animals will be managed. There exists a potential for non-target effects and so a prescription on how these are reduced is needed. This can occur via the EMP. This would include adherence to the legislative requirements that are designed to limit herbicide spray drift and reduce the potential for non-target effects of (for example) rodenticides.

John and Jenny Brown

161. I am not especially familiar with the submitters' property but note that there is a QEII covenant roughly 200m downgradient (west) of the proposed designation, identified in the ecological assessment as "ITF1". The AEE assumes that there will be no change in the underlying hydrological regime of this forest.

162. The forest is described in Horizons' ecological data as "WF 3 Tawa, titoki, podocarp forest" which indicates that is a dryland forest type. Permanently increased levels of soil saturation may be detrimental to this forest.

Stephen and Karen Prouse

163. In addition to the mitigation of noise and visual effects through planting, the Prouse family identify that that the area of forest (of types ETF7, ETF8 and MTF6 located eastward and adjacent chainages 16200 to 16500) on their property is immediately adjacent to the proposed designation.

164. The Prouse family have requested the relocation of any culturally significant species. The submission does not identify what those species are and so I am unable to comment specifically. However, the ecological technical assessments identify the site as having ornate skink, possibly other lizard species, possibly *Powelliphanta* species, and kererū among

other common native birds. The patch of forest is considered high ecological value for ornate skink[63] and very high value for invertebrates.[64]

165. It is my understanding that the vegetation on the Prouse property is not subject to clearance.[65] I also note that the designation abuts the forest and there is no buffer (either through proposed planting or a specified "no go" zone) between the forest and the indicative design. Therefore, it is very possible that there may be some ecological disruption of the habitat should the design change and bring activity closer to the Prouse family property. This disruption would be limited to edge disturbance.

166. The assessment of effects Table J.3 identifies the need for buffer planting of vegetation type MTF6. Because this vegetation type is already buffered by ETF7, a planted buffer for MTF6 would be superfluous. Table J.3 identifies that ETF7 and ETF8 only need to be subject to dust suppression measures to reduce the ecological effects to negligible. These reasons may explain why there is no vegetation buffer in the proposed planting plan.

167. My review suggests that the absence of a buffer between the indicative design and the area of forest is contrary to the technical reports with the AEE. Sub-appendix J.6 identifies that forest types containing ornate skink (which includes ETF7 and ETF8) should be subject to vegetation buffers to mitigate temporary and ongoing disturbance of ornate skink.[66] Sub-appendix J.7 identifies (as a specific example) that the potential snail habitat on property 479 (the Prouse family property) will likely be impacted by the exacerbated edge effects from the proposed alignment running directly adjacent.[67] Indigenous planting is recommended to complement existing remnants.[68]

[63] Technical Assessment J.6, Table 4, pg.34.
[64] Technical Report J.7, Table 4, pg.18.
[65] Although I get the impression from reading their submission that the Prouse's anticipate the removal of the macrocarpa trees that are adjacent to the proposed designation.
[66] Assessment J.6, Table 6.a, pg.37.
[67] Technical Report J.7, par. 91, pg. 24.
[68] Technical Report J.7, par. 98, pg. 25.

168. In the absence of any buffer in the planting layout plans, there is a risk that changes to the indicative design could lead to significant adverse faunal effects on the vegetation on the Prouse family property.

169. Further, disturbance of the species that are using the existing habitat through relocation may be more harmful than good for the animals concerned. It is my view that the ecological effects on fauna using that forest could be better managed by leaving the species where they are, and making sure that there is a planted buffer of an adequate depth and density to provide ecological buffering from the effects of construction. Planting should be undertaken before construction begins.

Lindsay Poutama

170. I acknowledge Mr Poutama's general support of the proposed ecological offsets and mitigations. I note that he has no particular ecological concerns, with the proposed solutions addressing long-held concerns with the effects of the current motorway.

The Wellington Fish and Game Council ("**Fish and Game**")

171. I acknowledge Fish and Game's conditional support for the creation of wetland habitat along the road corridor to assist with managing stormwater and providing habitat. I also note its opposition to the use of such wetlands as the means for offsetting losses in size, abundance, distribution, connectivity or function of natural wetlands.

172. I agree with the argument that devices used primarily for stormwater management should not replace loss of extent of natural inland wetland. This is primarily because these devices, while providing useful wetland habitat over some of their life, may need future maintenance (e.g. de-sludging) which is contrary to the goal of protecting and enhancing wetland habitats / biodiversity.

173. However, I do not agree that the loss of wetland extent could not be offset through the creation of new wetland extent. The new proposed open water habitat is one example where the extent of new wetland habitat is so much larger than the original area of lost habitat, that there

is potential to provide greater opportunity for (say) waterfowl nesting and feeding than what exists within the present environment.

The Royal Forest and Bird Society ("**F&B**")

174. I acknowledge F&B's satisfaction with the applicant's overall assessment of and response to ecological effects. I note that F&B's opposition to the proposal lies with the various timeframes set out in the conditions. As I have noted through my report, there are perpetual effects that are being compensated for and those compensations (namely the establishment of ecological linkages and the lizard / snail sanctuary) need to give effect to a perpetual (i.e. permanent) outcome of net gain with reliable enough proof (on the balance of probability). In my view, the relief sought by F&B improves the level of certainty that the compensations will lead to net gain.

175. I agree that the timeframes for pest plant control and the lack of consideration for the need for rabbit and hare (and deer for that matter) control all lead to risks that the canopy cover objectives will not be attained within the stipulated 8 years. I also agree that the attainment of those objectives could be slowed by the reasons identified by F&B such as drought and pest browse. I also observe that REM12 only deals with the offset planting sites and does not deal with the improved ecological linkages sought through the landscape and natural planting. In my view, the relief sought by F&B should also extend to these plantings. This will ensure that the potential habitat availability and connectivity is maximised as anticipated under the application.

176. The attainment of a self-sustaining habitat that is robust to weed incursion is a desirable outcome, but with the potential for incursion of vine weeds such as old man's beard (*Clematis vitalba*) and banana passionvine (*Passiflora mollissima*), that outcome may never be truly attainable. Arguably, because the planting (including landscape and natural character) address perpetual effects, it is reasonable that Waka Kotahi should be responsible for the annual control of invasive exotic weeds within the proposed designation and across all of the planting sites for the life of the highway. However, a condition for perpetual pest plant control in itself does not provide a reliable performance measure

for net gain at the offset sites. I prefer to have regard to the attainment of and reasonably foreseeable persistence of a satisfactory level of indigenous-dominated canopy cover as the measure of success toward resilience and self-sustainability. What a satisfactory level of canopy cover constitutes (80% - 90% depending on the habitat type) does not seem to be in dispute. The perpetual maintenance of pests could be dealt with through the legal agreements / covenants with landowner / occupiers.

177. REM19(d) provides for further offsetting if net gain is not evident in the 8-year timeframe set aside for establishing the canopy cover outcomes and other measures of improved biodiversity.[69] I do not see the condition as shifting the goalposts as F&B observe, but rather the contingency plan in the event of failure for the wetland offsets (which are modelled to attain net gain by year 8) or projected failure for forest and treeland offsets (which have attributes that are modelled to attain net gain 15-, 20-, or 25-years' time). A review at 8 years under REM19 could lead to a rather subjective call as to whether these measures *are expected* to be achieved. The condition presently provides an opportunity for *expectation* rather than proof of net gain, and could potentially lead to a decision to cease further site maintenance (and success measurement) at year 8, without objective evidence that net gain is attainable. To prevent premature cessation of maintenance, REM 19 needs to make more explicit reference to each of the measures that may realistically start to indicate net gain by year 8 and a further term of assessment at year 25 (for forests).

James Lambie

28 April 2023

[69] As reflected in the offsetting calculations.

M. FIGURES

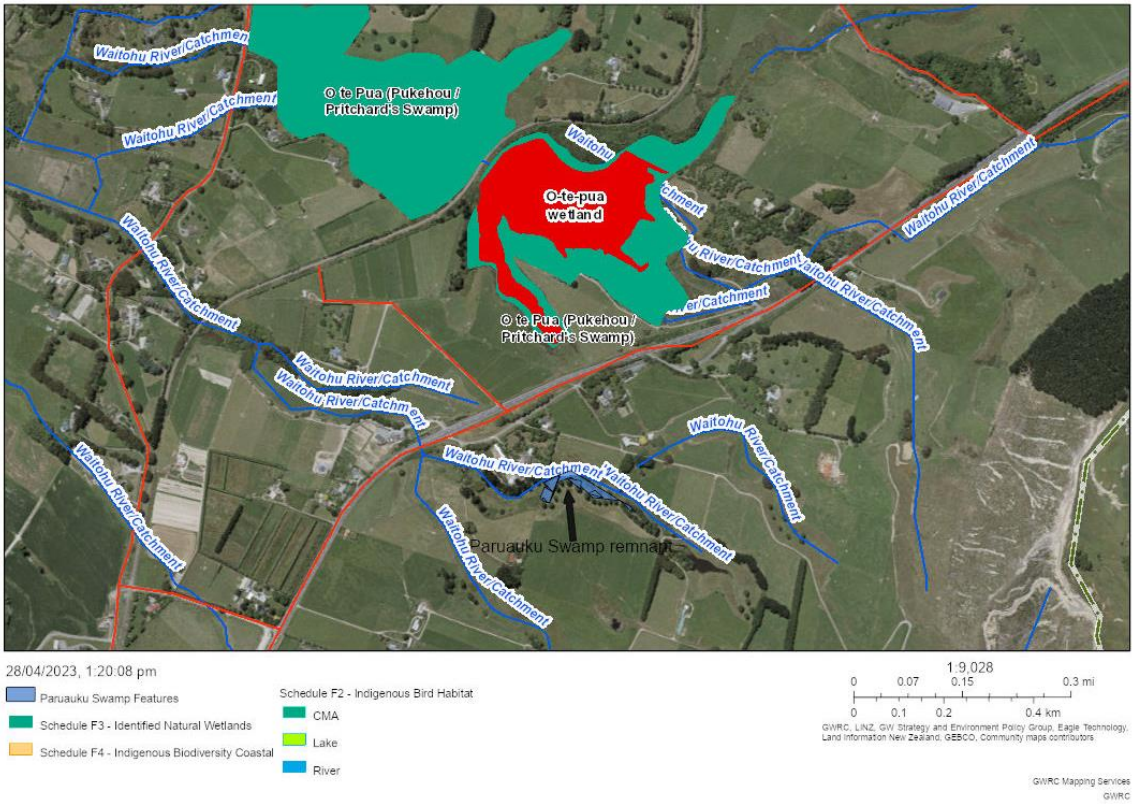

Figure 1. The location of "O-te-pua" (marked in red) in relation to the Paruauku Swamp remnants affected by the Project (marked with a black arrow). Location data care of GWRC, current as at April 2023.

Figure 3. The locations of "Koputaroa Rail Wetland" and "Koputaroa Swamp 3 (top centre of image) in relation to the rail corridor, SH57 and Koputaroa Road. Location data care of Horizons, current as at April 2023.